

IN THE CLAIMS:

Please cancel claims 1-32.

Kindly add claims 33-68 to this patent application:

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33. A filtering face mask that comprises:

(a) a mask body that is adapted to fit over the nose and mouth of a wearer, the mask body comprising a filtration layer through which inhaled air may pass before being inhaled by a wearer of the face mask; and

(b) an exhalation valve that is attached to the mask body, the exhalation valve allowing air exhaled by a wearer to pass from an interior of the mask body to its exterior without having to pass through the filtration layer, the exhalation valve comprising:

(1) a valve seat that comprises:

(i) a seal surface; and

(ii) an orifice that is circumscribed by the seal surface; and

(2) a single flexible flap that has one stationary portion and one free portion and a circumferential edge, the circumferential edge having a first segment that is associated with the one stationary portion of the flap so as to remain at rest during an exhalation and having a second segment that is associated with the one free portion of the flexible flap so as to be lifted away from the seal surface during an exhalation, the second segment of the circumferential edge also being located below the first segment when the filtering face mask is worn on a person, the flexible flap being mounted to the valve seat such that the one free portion of the flap exhibits a curvature when viewed from the side and is pressed towards the seal surface in an abutting relationship with it when a fluid is not passing through the orifice.

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34. The filtering face mask of claim 33, wherein the flexible flap is not wholly circular in configuration when viewed from the front.

35. The filtering face mask of claim 33, wherein the second segment of the circumferential edge has a circular curvature that corresponds to a circularly shaped seal surface disposed beneath the second segment of the flap's circumferential edge.

36. The filtering face mask of claim 33, wherein the valve seat has a flap retaining surface, the flexible flap being mounted to the flap-retaining surface.

37. The filtering face mask of claim 36, wherein the flap retaining surface is planar.

38. The filtering face mask of claim 37, further comprising a valve cover, the valve cover having an opening that allows exhaled air to pass therethrough and also having a surface that holds the flexible flap against the flap-retaining surface on the valve seat.

39. The filtering face mask of claim 38, wherein the flexible flap is secured to the valve seat by mechanical clamping.

40. The filtering face mask of claim 39, wherein the flap-retaining surface is disposed on the valve seat on one side of the seal surface.

41. The filtering face mask of claim 37, wherein the flap-retaining surface includes two securement points both disposed outside a region encompassed by the orifice.

42. The filtering face mask of claim 36, wherein the curvature in the flexible flap extends from a point where the flap is mounted to the valve set to a second point where the free portion of the flexible flap makes contact with the seal surface.

43. The filtering face mask of claim 42, wherein the curvature does not have an inflection point.

44. The filtering face mask of claim 33, further comprising a valve cover that has an opening that permits exhaled air to pass therethrough, the valve cover also having a fluid-impermeable ceiling that increases in height in the direction of the flexible flap from the first segment of the circumferential edge towards the second segment of the edge.

45. The filtering face mask of claim 41, wherein the opening in valve cover has cross-members extending thereacross and is positioned directly in the path of fluid flow approximately parallel to the path traced by the second segment of the circumferential edge during opening and closing of the free portion of the flexible flap.

46. The filtering face mask of claim 33, wherein the valve seat's orifice is circular and has cross-members disposed within the orifice to assist in preventing the flexible flap from being drawn into the orifice during an inhalation.

47. The filtering face mask of claim 33, wherein the valve seat includes one or more cross members that are disposed within the orifice of the valve seat.

48. The filtering face mask of claim 46, wherein the cross members are slightly recessed beneath the seal surface when viewed from a side elevation.

49. The filtering face mask of claim 46, wherein the shape of the orifice, when viewed from the front, does not wholly correspond to the shape of the seal surface.

50. The filtering face mask of claim 33, wherein the valve seat includes a flange portion that defines a mounting surface for the valve seat, which surface extends 360° around the valve seat at its base and enables the valve seat to be secured to the mask body.

51. The filtering face mask of claim 33, wherein the flexible flap assumes a curved profile, when in its closed state, that extends in from where the flexible flap contacts a retaining surface on the valve seat to where the second portion of the flexible flap contacts the seal surface of the valve body portion.

52. The filtering face mask of claim 33, wherein the flap retaining surface is oriented transversely relative to the orifice.

53. The filtering face mask of claim 52, wherein the flap retaining surface is positioned adjacent one side of the orifice.

54. The filtering face mask of claim 33, wherein the valve seat includes a peripheral flange for mounting the exhalation valve to the mask body, the valve seat also having a seal ridge that extends upwardly so that the seal surface is upwardly spaced relative to the peripheral flange.

55. The filtering face mask of claim 33, wherein the flexible flap is mounted to the valve seat in cantilever fashion.

56. The filtering face mask of claim 33, wherein the valve seat is made from a relatively light-weight plastic that is molded into an integral one-piece body.

57. The filtering face mask of claim 33, wherein the seal surface is substantially uniformly smooth to insure that a good seal occurs between the single flexible flap and the seal surface, and wherein the flexible flap is made from a material that is capable of allowing the flap to display a bias towards the seal surface, and wherein the flexible flap would normally assume a flat configuration when no forces are applied to it.

58. The filtering face mask of claim 57, wherein the bias towards the seal surface is generated by the mounting of the flap to the valve seat.

59. The filtering face mask of claim 58, wherein the flexible flap has a stress relaxation sufficient to keep the flexible flap in an abutting relationship to the seal surface under any static orientation for 24 hours at 70 °C.

60. The filtering face mask of claim 59, wherein the flexible flap is made from a crosslinked polyisoprene.

61. The filtering face mask of claim 58, wherein the flexible flap has a Shore A hardness of about 30 to 50 and has a generally uniform thickness of about 0.2 to 0.8 millimeters.

62. The filtering face mask of claim 33, wherein the flexible flap is longer in the direction extending from the first segment of the circumferential edge to the second segment.

63. The filtering face mask of claim 33, wherein the first segment of the flexible flap is about 10 to 25 percent of the total circumferential edge of the flexible flap, and the second segment is about 75 to 90 percent being free to be lifted from the seal surface.

64. The filtering face mask of claim 44, wherein the flexible flap and valve cover are positioned on the valve seat such that exhaled air is deflected downward during an exhalation when the filtering face mask is worn on a person.

65. The filtering face mask of claim 33, wherein the mask body is cup-shaped and comprises (1) a shaping layer for providing structure to the mask, and (2) a filtration layer.

66. The filtering face mask of claim 33, wherein at least 60 percent of the total airflow flows through the exhalation valve under a normal exhalation test.

67. The filtering face mask of claim 33, wherein at least 73 percent of the total airflow flows through the exhalation valve under a normal exhalation test.

68. The filtering face mask of claim 67, wherein the exhalation valve is positioned on the mask body substantially opposite to a wearer's mouth.

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